NORMAL AGING CHANGES

March 19, 2015 Webinar

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Objectives:

1. **Describe the "normal" changes that occur with aging in the human body.**
2. **Understand each older adult is a unique human being that ages according to their own pace.**
3. **Discuss basic interventions & therapeutic treatment methods that promote healthy aging, function & quality of life.**

WHY Do We Need to Understand Normal Aging?

- **Aging is not a disease!**
- **If we are living, we are aging!**
- **Dispel common myths of aging**
- **In order to determine deviations from normal** *(illness/disease symptoms)***, we must understand what changes occur naturally**
- **Proactive vs. reactive approach to living**
- **Add quality to life** *(for however long that is)* **& promote optimal aging!**

- **Practice from a strength based vs. deficit model of care**
- **Changes in the way we age depend on:**
  - **Genetic factors**
  - **Environment**
  - **Nutrition/diet**
  - **Activity level**
  - **Stress**
  - **Lifestyle choices**
- **No cookbook or recipe approach**

- **Help educate ourselves & older adults on how to take care of the mind – body – spirit as aging approaches & as we live it!**
- **Empowerment**
- **Increase self-esteem through positive self-awareness**
- **"CQI of Self"©**

Hair Changes:

- **Loss of pigmentation**
  - **Decreased production in melanin**
  - **Hair color changes**
- **Fewer hair follicles on scalp**
  - **Hair thins; baldness**
  - **Increase in facial hair; coarser** *(women)*
- **Growth rate of hair decreases**
  - **Loss of pubic & axillary hair** *(women)*
- **Hair growth increases & thickens**
  - **Eyebrows, ears & nose** *(men)*

Interventions:

- **Wash hair only when it is oily/greasy**
- **Utilize protein conditioner after shampoo**
- **Handle hair as little as possible**
- **Chemicals should be applied directly to the hair & not the scalp**
- **Minimize tension on the hair root**
- **Keep hair shorter**
- **Cover head when outside in the sun**
- **Clip facial hair or utilize another safe method of removal**

Nail Changes:

- **Decreased growth rate**
- **Change in color** (more yellow)
- **Decreased shine**
- **Appearance is flat & concave**

- **Healing delayed**
- **Longitudinal ridging increases**
- **Characteristics: hard, thick, dull, brittle, coarse, discolored, splitting**

Interventions:

- **Soak nails before trimming with a clipper**
- **Trim nails without cutting into the skin/quick**
  - ***Generally* straight or to the contour of the toe**
- **File rough edges with emery board**
- **Put socks on before underwear**
- **Wear shoes & socks at all time**
- **Protect fingers & toes from injury/trauma**
- **Look at feet several times a week**
- **Dry between fingers & toes thoroughly**

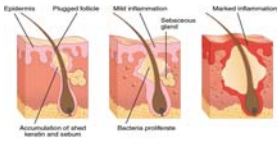
Skin Changes:

- **Intrinsic = true changes of aging; over time**
- **Extrinsic = caused by environment**
  - **Photoaging - due to preventable chronic exposure to ultraviolet (UV) radiation superimposed on intrinsic aging**
- **Thinning of the area between the epidermis & dermis; area looks more translucent, pale**
  - **Areas exposed to sun become thicker**
- **Decrease in elastin** *(protein keeps skin flexible)*
- **Decrease in collagen** *(protein keeps skin smooth)*

- **# of melanocytes** *(pigment containing cells)* **decreases & irregularity increases**
  - **Remaining melanocyte cells increase in size** *(age spots, lentigos in sun exposed areas)*
- **Cell reproduction slows**
- **Decrease in size of remaining cells**
- **Decreased thickness** *(atrophy)*
- **Slowed repair rate**
- **Decreased # & distorted structure of specialized nerve endings**

- **Blood vessels in the dermis become fragile** *(increased bruising, bleeding under the skin)*
  - **Decreased cellularity & vascularity**
  - **Increase in vascular fragility**
- **Subcutaneous layers of adipose** *(fatty)* **tissue decrease**
  - **Change in distribution**
    - **Less on extremities & more on trunk**
- **Thinning & loss of subcutaneous fat causes the skin to loose some of its ability to act as a barrier to prevent dehydration**

  - **Decreased insulation increases risk of skin injury & reduces the ability to maintain body temperature**
    - **Hypothermia can result**
- **Some medications are absorbed by the fat layer & loss of this layer changes the way that some medications work**



- **Decreased # & secretion of eccrine/merocrine** *(sweat)* **glands** *(predisposition to heatstroke)*
- **Apocrine glands** *(axillary & groin)* **decrease in size & function** *(decreased body odor)*
- **Sebaceous gland secretion** *(sebum)* **decreases** *(~ 23% each decade after puberty)*
- **Increased incidence of growths & neoplasms** *(benign or malignant)*
- **Gravity, facial movement & sleep positions also contribute to the way the face ages**

Functional Changes

- **Declines in cell replacement**
- **Decreased barrier function & wound healing**
- **Decreased immunologic responsiveness**
- **Change in thermoregulation**
- **Vitamin D production decreased**
- **DNA repair altered**
- **Elasticity losses**
- **Inflammatory responsiveness declines**
- **Mechanical protection decreased**
- **Sensory perception decreased**
- **Sweating & sebum production decreased**

Interventions:

- **Full bath only 2-3 times per week**
- **Use warm/tepid water** *(water heater = 120°F)*
- **Use mild soaps on body** *(Aveeno)*
- **Super fatted soap** (or none) **on face** *(Dove, Basis, Neutrogena)*
- **Apply lotion to moist skin**
- **Pat dry instead of rubbing**
- **Avoid excess sun, wind, cold**
- **Avoid sun between 10 – 3 pm**
- **Use at least SPF #15 sun block**
- **Cover face, arms & head when outside**

- **Wear sunglasses when outside**
- **Examine own skin on a regular basis**
- **Wear non-irritating clothing** *(cotton or synthetics)*
- **Good nutrition**
- **Adequate fluids**
- **Regular exercise**
- **Yearly skin examinations**
- **Stop smoking**
- **Do not tan**

Vision Changes:

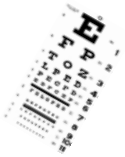
- Lens becomes dense & less elastic *(accommodation decreased)*
- Presbyopia
- Decrease in visual acuity
- Narrowing of visual field
- Decreased peripheral vision & depth perception
- Development of *arcus senilis* around iris
- Colors fade & disappear

- Lens may develop opacity *(cataract)*
- Macula degenerates
- Conjunctiva becomes yellow & thin
- Tearing decreases
- Pupils may change size
- Decreased blood flow to retina
- Decreased elasticity of eyelid muscles
- Changes in the corneal curvature
- Increase in lens size & density
- Sclerosis & rigidity of the iris

- Decreased orbital fat pads
- Atrophy of the ciliary muscle
- Shrinkage of gelatinous substance in the vitreous
- Atrophy of photoreceptor cells
- Thinning & sclerosis of retinal blood vessels
- Degeneration of neurons in the visual cortex
- Recovery time from light to dark & vice versa is delayed
- Decreased ability to focus on close objects

Evaluation Techniques:

- Visual acuity charts
  - Snellen
  - Jaeger
- Headline or sentence from newspaper
- Observation of ambulation
- Hand shake*
- Ability to complete forms



Interventions:

- Increase lighting without glare
- Position objects consistently
- Sit or stand in field of vision
- Annual eye examination
- Always have extra pair of glasses
- Frequent cleaning of glasses
- Neck chain
- Get rid of old prescriptions *(can donate)*
- Use of magnifying lens

- Avoid abrupt luminance transitions
- Use of artificial tear solutions
- No high polish on floors
- No scatter rugs *(easily tripped over)*
- Driving during the day only
- Utilize yellow, orange & red colors
- Red light on in darkened rooms
- Mark steps with different colors
- Install sensor light switches or hand remote lighting control devices
- Flashlights in all rooms

Hearing Changes:

- ***External Ear***
  - **Thicker hair, thinner skin, increased keratin, lobe elongates** *(men, women with lifelong pierced ears – heavy earrings)*
- ***Middle Ear***
  - **Less resilient tympanic membrane, calcified ossicles, stiffer muscle & ligaments**
- ***Inner Ear***
  - **Fewer neurons & hair cells, diminished blood supply, degeneration of spiral ganglion**

- **High pitched sounds** *(s, th)* **are difficult to distinguish**
- **Unable to determine direction of sound**
  - **Difficulty with sirens on vehicles**
- **Common, reversible conductive hearing loss related to increased cerumen impaction**
  - **May be related to ear canal hair, osteophytic or osteoma bone growth, changes in sebaceous & cerumenous glands in the external ear**

Behavioral Cues:

- **Inappropriate or no response to questions**
- **Inability to follow verbal directions without cues**
- **Short attention span**
- **Easy distractibility**
- **Frequent requests for repetition or clarification of verbal communication**

- **Mouthing of words spoken by the speaker**
- **Turning of one ear toward the speaker**
- **Unusual physical proximity to the speaker**
- **Lack of response to loud environmental noises**
- **Conversational speech too loud**
- **Inarticulate speech**
- **Abnormal voice characteristics**
- **Perceptions that others are talking about him/her**

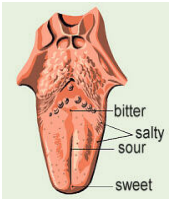
Interventions:

- **Use touch & eye contact to gain attention**
- **Reduce or minimize environmental noise**
- **Face individual in good lighting**
- **Do not put your hands near your mouth**
- **Avoid yelling or shouting**
- **Use simple language & short sentences**
- **Speak slowly**
- **Use grease boards, computers or other writing tools**

- **Ears & hearing checked on a regular basis**
- **NO Q-TIPS or other equally inappropriate objects bigger than an elbow in the ears!**
- **Proper cleaning of hearing aid**
- **Make sure device is working & has new batteries**
  - **Keep extra batteries on hand**
- **Provide encouragement to wear hearing aids**
- **Avoid exposure to loud noises**

Taste Changes:

- **Loss of 50% of taste buds after age 70 ⇒ decreased ability to differentiate tastes**
  - **Sweet & salty taste lost 1st**
  - **Bitter & sour tastes last late into old age**
- **Temperature sensing mechanisms in mouth less accurate**



Interventions:

- **Eat food separately**
- **Different texture foods**
- **Try new foods**
- **Maintain good oral hygiene**
- **Home-cooked meals**
- **Steam vegetables briefly**
- **Use salt & pepper sparingly**
- **Use of herbs & other spices**

Smell Changes:

- **Capacity to smell remains stable until the 6th decade when there is start of decrease**
- **Marked change in 7th decade**
- **Progressive descent of the nasal tip**

Interventions:

- **Label & identify foods**
  - **Wrap & mark the date of purchase**
- **Have meals or groceries delivered on a weekly basis**
- **Use smoke alarms**
- **Stop smoking**

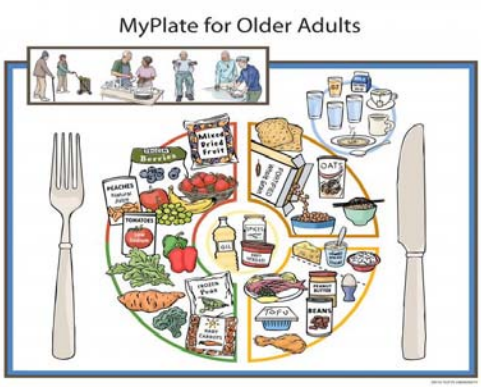
- **Use strong, pleasant odors** *(chocolate, bread, peppermint, coffee, pop corn, gingerbread)*
- **Ask for help!**

- **Refrigerate** *(40° or <)* **or freeze** *(0° or <)* **perishable food**
- **Do not thaw food at room temperature** *(use microwave, cold water, refrigerator)*
  - **Once thawed, cook immediately**
- **Wash hands with warm, soapy water**
- **Wash anything that touches raw meat**
- **Do not leave perishable food out** *(2 hour rule; temperature > 90° = 1 hour)*
- **Thoroughly cook raw meat** *(325°F)*

Sensory changes affect the appetite in several ways. Vision loss makes shopping, preparing food & eating more difficult. Diminished taste & smell take away the appeal of many foods & may lead to preparing or consuming food that is no longer safe.

Nutritional Changes:

- ***"Possible"* tooth loss or improper fitting dentures**
- **Basal Metabolic Rate (BMR) decreased by at least 10%**
- **Decreased need for calories every decade after 75**
- **Overall intake of food decreases** *(↓ activity)*
- **Inadequate intake of calcium & vitamin D**
- **Iron deficiency common**



Neurological & Cognitive Changes:

- **Decreased speed of recall & encoding**
- **Loss of ST memory**
- **Some nerve cells with fewer dendrites** *(branches)* **& become demyelinated** *(lose coating)*
- **Slowed thought processes**
- **Increased response time**
- **Susceptibility to centrally acting drugs**
- **Water content increases**
- **Postural sway**

- **Decreased vibratory sense & position sense**
- **Impaired adaptive responses to stress**
- **# neurons in brain & spinal cord decreased**
- **Decreased brain weight** *(peaks around age 20; gray matter – outer surface)*
- **Voluntary or automatic reflexes slower**
- **Decreased ability to respond to multiple stimuli**
- **"Benign" forgetfulness**
- **Increased time needed to learn**
- **Compromised thermoregulation**

Interventions:

- **Allow more time for tasks**
- **Introduce new skills slowly**
- **Encourage talking with others**
- **Help to set personal goals**
- **Change positions slowly**
- **Move head from side to side slowly**
- **Always use cane or walker – as instructed**
- **Institute fall precautions**

- **Encourage regular physical activity**
- **Intellectual stimulation**
- **Healthy nutrition**
- **Adequate hydration**
- **Restful sleep**
- **Safe driving courses**
- **Socialization**
- **Activate the senses – what a person sees, hears, smells, tastes & touches**

Change in Sleep Architecture:

- **Lengthened latency** *(time to fall asleep)*
- **Increased spontaneous awakenings**
- **Lighter sleep**
- **Decrease in amount of REM sleep** *(deep sleep reduced in comparison to younger adults)*
- **Nocturia**
- **Presence of pain**

Interventions:

- **Goal = improve sleep/wake cycle**
- **Relaxation, meditation, guided imagery**
- **Good sleep hygiene**
  - **Routine**
  - **No eating/drinking too close to bedtime**
  - **Bed for sleep & sex only**
- **Cognitive behavioral therapy (CBT)**
- **Comfortable bedclothes**
- **Regular exercise** *(aerobic, stretching, strength training)*
- **Quiet environment; cool temperature**

Changes in Voice:

- **Decreased range, duration & intensity**
- **Hyaline cartilages calcify** *(thyroid, cricoid)*
- **Voice quality diminishes r/t vocal cords bowing** *(decreased elasticity & muscle mass)*
- **More air escapes with phonation & may cause voice to be higher pitched & have a monotonous tone**
- **Related to changes in pulmonary function**

Interventions:

- **Voice therapy**
  - **Strengthening exercises**
    - **Respiration/phonation control**
- **Rest**
- **Drink plenty of fluids**
- **Good oral hygiene**
- **Regular dental exams**

Changes in the Musculoskeletal System (Bones & Muscles)

- **Bone mass per unit volume** *(density)* **progressively decreases** *(after age 50)*
  - **Aging disrupts the balance between cells that produce bone & cells that absorbs bone**
- **Enhanced bone fragility**
- **Decline in sex hormones**
  - **Menopausal bone loss** *(5–10 yrs post)*
  - **Decreased testosterone**
- **Cortical thinning & porosity**

- **Intervertebral disc degeneration**
- **Compression of spinal column**
- **Lengthening & narrowing of nose & ears**
- **Narrowing of shoulders**
- **Bony landmarks become more prominent**
- **Increased anterior-posterior diameter of chest**
- **Increased thoracic curve**
- **Change in stature with kyphosis** *(height reduction)*

- **Sarcopenia** *(degenerative loss of skeletal muscle & strength with aging)*
  - **Increased weakness**
  - **Poor exercise tolerance**

- **Tendon shrinkage**
- **Thickness of cartilage decreases** *(knees)*
- **Lean body mass replaced by fat** *(redistributed)*
- **Loss of muscle mass**
- **Loss of elasticity of ligaments, tendons, synovial membranes**

- **Connective tissue stiffness increases**
- **Decreased tendon & ligament strength**
- **Slowed regeneration of muscle tissue**
- **Increased resting tremor**
- **Decreased flexor responses**
- **# & size of muscle fibers progressively decrease** *(sarcopenia)*

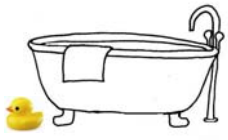
- **Reduction in muscle strength**

Interventions:

- **150 minutes/week moderate intensity aerobic activity** *(walking)*
  - **At least 10 minutes at a time**
- **Muscle strengthening activity 2/week**
- **Drink water before & after exercise**
- **Use the bathroom before exercise**
- **Wear athletic shoes & easy moving clothing**
- **Exercise with a partner**

- **Warm up & cool down**

- **Warm baths after exercise**
- **Calcium supplement or food added**
- **Vitamin D**
- **Treat pain appropriately** *(right drug, right dose, right time, right route; monitor response)*



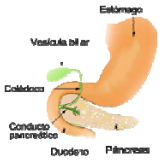
Gastrointestinal Changes:

- **Mouth**
  - **Decreased saliva production**
  - **Bone atrophy beneath teeth**
  - **Gingival retractions**
  - **Decreased strength mastication muscles**

- **Esophagus**
  - **Decreased motility**
  - **Decreased muscle strength**
- **Stomach**
  - **Decreased production of hydrochloric acid**
  - **Atrophy of gastric mucosa**

- **Small Intestines**
  - **Decreased absorption of nutrients** *(calcium)*
  - **Decrease in size & permeability of capillary bed**
  - **Decrease in lactase** *(helps digestion dairy foods)*
- **Large Intestines**
  - **Atrophy of mucosa & connective tissue**
  - **Elongation & dilation of colon**
  - **Increased blood vessel tortuosity**
  - **Decreased sphincter tone**
  - **Decreased motility & reduced peristalsis**

- **Liver**
  - **Decreased blood flow**
  - **Increased time to metabolize drugs & chemicals** *(1/2 life of drugs can be doubled)*
  - **Decreased synthesis of cholesterol**
  - **Diminished capacity to regenerate damaged cells**
- **Pancreas**
  - **Decrease in overall weight**
  - **Duct hyperplasia**
  - **Lobular fibrosis**



Interventions:

- **Regular dental exams**
- **Oral care @ least 2xday**
- **Slow speed of eating**
- **Chew more frequently**
- **Drink fluids at meals**
- **Increase fiber in diet – slowly**
- **Avoid gas producing foods**
- **Smaller bites of food**
- **Healthy foods**
- **Eat sitting up**

- **Do not lay down after eating**
- **Education regarding bowel elimination**
- **Discourage laxative use**
  - **However, if on constipating medication, need to have a bowel regimen in place**
  - **Natural method – bran, applesauce, prune juice (BAP)**
- **Exercise & movement**
- **Socialization**
- **Eating at table**
- **Not eating 3 hours prior to bedtime**

Cardiovascular Changes:

- **Increased peripheral vascular resistance**
- **Increased collagen resulting in decreased elasticity of the vasculature**
- **Modest increase in left ventricular wall thickness**
- **Enlargement of the left atrium**
- **Slight enlargement of the left ventricular cavity**
- **Takes longer for heart rate & blood pressure** *(BP)* **to return to normal resting levels after exertion or stress** *(decreased cardiac reserve)*

- **Valves between chambers of the heart become thicker & stiffer** *(heart murmurs common)*
- **Sclerosis of atrial & mitral valves**
- **Loss in # of pacemaker cells** *(slower heart rate)*
- **Increase in amount of fibrous tissue & fat deposits in the myocardium** *(dysrhythmias & extra beats more common; heart block possible)*
- **Shift in circulation of blood to some organs** *(kidneys [50%]; brain [15 – 20%])*

- **Cardiac myocytes increase in size**
- **Arteries become dilated & elongated**
- **Aortic pulse wave velocity increases**
- **Arterial stiffening** *(increasing systolic BP)*
- **Cardiac index decreases**
- **Oxygen utilization or uptake decreases**
- **Baroreceptors less sensitive**
  (orthostatic hypotension &/or dizziness with position changes)

Interventions:

- **Wear socks to bed**
- **Protect from infections**
- **Pneumovax & influenza immunizations**
- **Annual physical examination**
- **Avoid <u>excessive</u> exercise or stress**
- **Change positions slowly**
- **Dangle feet when changing positions** *(lying to sitting or standing; 1 – 2 minutes)*
- **Avoid prolonged recumbency**

- **Smoking cessation**
- **Fall prevention strategies**
- **Maintain healthy body weight**
- **Exercise**
- **Effective coping mechanisms**
- **Stress reduction**

Pulmonary Changes:

Progressive decline in pulmonary function may be due to exposure to environmental toxins or due to exhaustion of internal respiratory reserve & repair caused by aging itself

- **↓ strength respiratory muscle function** *(decreased endurance)*
- **↑ stiffness of chest wall** *(ossification of cartilage-rib articulation)*
- **Chest wall becomes more rigid**
- **Residual volume increases** *(amount of air remaining in lungs after maximum expiration; total at age 60 = 35%)*
- **Vital capacity decreases** *(volume of air that can be forcibly exhaled)*
- **↓ loss of elastic recoil of lungs**

- **Alveolar surface area decreases → reduced maximum oxygen uptake** *(the volume of air that can be moved in & out by forced voluntary breathing)*
- **Alveoli collapse sooner on expiration** *(increases risk for respiratory diseases [atelectasis])*
- **Exercise capacity decreases**
- **Decrease in # of cilia** *(prone to respiratory infections)*
- **# of mucus producing cells may increase**
- **Normal arterial saturation formula**

  100 – 1/3 of age =

  "normal" for that individual

- **Reduced compliance**
- **Drier mucus membranes**
- **Decreased cough reflex**
- **Decreased exercise tolerance**

Interventions:

- **Use abdominal muscles to help breathing**
- **Stop smoking or using tobacco products of any kind**
- **Avoid large crowds during flu & cold seasons**
- **Pneumovax & influenza vaccinations**
- **Cover mouth in the cold**
- **Good nutrition & appropriate hydration**
- **Exercise**

Endocrine System:

- **Important Principles:**
  - **A particular hormone may have an effect on many body systems & functions**
  - **One body function may require the coordinated action of many hormones**
- **Growth hormones decrease** *(decreased muscle mass)*
- **Decreased aldosterone levels** *(prone to dehydration)*
- **Insulin less effective & less insulin may be produced** *(sugar level increases after a large meal & takes longer to return to normal; increased risk of developing type 2 diabetes)*

- ***Increased Levels***
  - **Atrial natiuretic hormone; vasopresin; norepinephrine; parathormone**
- ***Normal Levels***
  - **Calcitonin; cortisol; epinephrine; prolactin; thyroxine**
- ***Decreased Levels***
  - **Corticotropin; TSH; growth hormone; IGF – I; renin; aldosterone; triiodothyronine; insulin**

Renal Changes:

- **Renal & cortical blood flow decreases** *(10% per decade)*
- **Decrease glomerular filtration rate ***
- **Renal mass progressively declines**
  - **# & size of nephrons (filtering units) decreases**
- **Regulation of vasopressin declines**
- **Diverticula begin to appear in distal nephrons**
- **Large renal blood vessels become sclerotic**
- **Kidneys less efficient in concentrating urine & eliminating solutes from the blood**

- **Altered excretion of drugs**
- **Decreased ability to concentrate or dilute urine in response to water or NaCl excess**
- **Decreased creatinine clearance**
- **Cockroft-Gault Equation = calculation of creatinine clearance in older adults:**
  - ***For Men***

$$\text{Creatinine clearance (ml/min)} = \frac{(140 - \text{age in years}) \times (\text{body weight in kg})}{72 \times (\text{serum creatinine, mg/dL})}$$

  - ***For Women*****, the calculated value is multiplied by 85% (0.85)**

- **Risk of volume overload** *(heart failure),* **dehydration, hyponatremia** *(with thiazide diuretics),* **hypernatremia** *(associated with fever),* **hyperkalemia** *(with potassium-sparing diuretics)*
- **Reduced excretion of acid load**
- **Increased risk of urinary urgency, UTI, nocturnal polyuria**
- **Potential for falls**

URINARY INCONTINENCE IS ***NOT*** A NORMAL AGING CHANGE!

- **Fibrous connective tissue replaces the smooth muscle & elastic tissue in the bladder**
- **Uninhibited contractions increased**
- **Normal for 50 cc or < of residual urine to remain after urination**
- **Nocturnal urine production**
- **Bladder muscles weaker**
- **Prostate enlargement** *(BPH)*
- **Decreased force of urine stream**
- **Decreased bladder capacity**

Interventions:

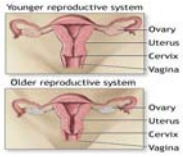
- **Monitor nephrotoxic & renally cleared drug levels**
- **Maintain fluid/electrolyte balance**
  - ***Minimum 1,500 - 2,500 ml/day from fluids & foods for 50 to 80 kg adults to prevent dehydration***
- **Limit fluids in the evening**
- **Avoid caffeine**
- **Fall precautions**

- **Teach Pelvic Floor Exercises (PFE) or Kegel Exercises accurately!**
- **Exercises performed several times/day**
- **Drink plenty of water**
- **Prompted voiding schedule**
- **Urinate about every 4 hours**
- **Do not drink fluids 2 hours before bed time**
- **Watch food & drink that may irritate the bladder**
- **Loose fitting clothing**

Reproductive System – Female:

- **Fallopian tubes atrophy & shorten**
- **Ovaries become thicker & smaller**
- **Vaginal environment more alkaline**
- **After menopause:**
  - **Decreased production estrogen** *(95%)*
  - **Rapid decline in oocytes** *(immature ovum/egg)*
- **Weakened pelvic musculature & supporting structure**

- **Uterine lining thins & becomes less elastic**
- **Reduced vaginal secretions**
- **Vaginal walls become thinner & less elastic**
- **Decrease in hormones causes relaxation of ligaments & loss of muscular tone that alter the contour of the breast**



- **Hormone Changes:**
  - ***Increased Levels***
    - **FSH** *(follicle stimulating hormone)*
    - **LH** *(luteinizing hormone)*
  - ***Normal Levels***
    - **Total testosterone**
  - ***Decreased Levels***
    - **Estradiol**
    - **Estrone**
    - **Progesterone**

Reproductive System – Male:

- **Some decrease in sperm production** *(wide variability among men; can remain fertile into late years)*
- **Require longer stimulation period**
- **Greater length of time between ejaculations**
- **Erection slower, less full**
  - **Erectile dysfunction** *(impotence = an erection cannot be achieved)* **is experienced by 15% of men by the age of 65 & increases to 50% by age 80**
- **Testicular atrophy** *(decrease in size)*
- **Prostate gland becomes enlarged, firm & smooth**

- **Hormone Changes:**
  - ***Increased Levels***
    - **FSH**
    - **LH**
    - **Estradiol**
  - ***Decreased Levels***
    - **Testosterone** *(up to 35%)*
    - **Bioavailable testosterone**

Interventions:

- **Use KY jelly or other soluble liquid for lubricant**
- **Take time for planned romance**
- **Foreplay very important**
- **Manual stimulation**
- **Touch**
- **Listen & talk**

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